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(12) **United States Patent**
Gano et al.(10) Patent No.: **US 6,189,616 B1**
(45) Date of Patent: **Feb. 20, 2001**(54) **EXPANDABLE WELLBORE JUNCTION**(75) Inventors: **John C. Gano, Carrollton; Tommie A. Freeman, Flower Mound; Jim R. Longbottom, Magnolia; John S. Bowling, Dallas, all of TX (US)**(73) Assignee: **Halliburton Energy Services, Inc., Dallas, TX (US)**

(*) Notice: Under 35 U.S.C. 154(b), the term of this patent shall be extended for 0 days.

(21) Appl. No.: **09/522,913**(22) Filed: **Mar. 10, 2000****Related U.S. Application Data**

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(51) Int. Cl.⁷ **E21B 7/08; E21B 43/14**(52) U.S. Cl. **166/298; 166/55.1; 166/117.6; 166/313; 166/376; 175/81**(58) Field of Search **166/50, 55.1, 117.5, 166/117.6, 298, 313, 376; 175/79, 80, 81, 82**(56) **References Cited****U.S. PATENT DOCUMENTS**

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(57) **ABSTRACT**

Multiple wellbores are interconnected utilizing a deflection device having a guide layer of lower hardness than the body of the deflection device, and a cutting tool having a guide portion and being operative to cut through the deflection device guide layer and a tubular structure lining a wellbore.

13 Claims, 22 Drawing Sheets